DOCUMENT RESUME

ED 346 145 TM 018 477

AUTHOR Nava, Fe Josefa G.; Loyd, Brenda H.
TITLE An Investigation of Achievement and Nonachievement Criteria in Elementary and Secondary School Grading.
PUB DATE Apr 92
NOTE 35p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, April 20-24, 1992).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; Achievement Tests; Classroom Techniques; Comparative Analysis; Discriminant Analysis; *Elementary School Teachers; Elementary Secondary Education; *Evaluation Criteria; Factor Analysis; Factor Structure; *Grading; *Secondary School Teachers; *Student Evaluation; Teacher Attitudes

ABSTRACT

Criteria that teachers include in grading and the weight given each were investigated in a sample of 827 elementary school and high school teachers from 18 school districts. A three-section survey was administered to the subjects. Underlying dimensions of grading criteria were studied, and the relationship between including a specific criterion and its weight in a specific classroom context was examined. Elementary school and high school teachers were compared for use of grading criteria. Frequencies of teacher responses to 35 grading criteria were tabulated. Factor analysis and discriminant analysis identified teacher criteria. Teachers indicated that they definitely included five criteria in grading (unit tests, quizzes, essays or papers, effort, and semester tests). Six criteria were identified as probably included (projects, assignments, book reports, class participation, ability, and behavioral criteria), and four others were selected as "probably not" (spelling, grammar, handwriting, and aggressiveness). Gender, parent involvement in school activities, and parent involvement in class activities were identified as definitely not to be included. Four factors were identified as underlying dimensions of the grading criteria: (1) classroom behavior and characteristics enhancing the learning process; (2) measures of achievement and academic content; (3) student behavior and non-content academic skills; and (4) traits and factors external to the classroom. Clear differences were seen between elementary school and secondary school teachers. There are nine tables of study findings and a 12-item list of references. (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Fe' Josefa G. Nava

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED346145

AN INVESTIGATION OF ACHIEVEMENT AND NONACHIEVEMENT CRITERIA IN ELEMENTARY AND SECONDARY SCHOOL GRADING

Fe' Josefa G. Nava
Brenda H. Loyd
University of Virginia

Paper presented at the annual meeting of the
American Educational Research Association,
San Francisco, April 1992

Running Head: GRADING CRITERIA

TM018477

BEST COPY AVAILABLE

An Investigation of Achievement and Nonachievement Criteria in Elementary and Secondary School Grading

Evaluation and grading are two important and necessary aspects of teaching that are often difficult to perform (Kirschenbaum, et al., 1971; Hills, 1981). From previous studies and documents on grading practices (Agnew, 1985; Leiter & Brown, 1985; Stiggins, et. al., 1986), it is obvious that there exists a multitude of criteria for determining students' grades, and that these grading criteria vary from subject to subject and from one school system to another. Foremost among the criteria are achievement-related measures such as tests, quizzes, homework, and projects. Also included in the grading process are nonachievement traits such as effort, work habits, and behavior. This leads to the conclusion that grades reflect both achievement and nonachievement characteristics. In addition, it is not certain whether nonachievement criteria are used as a general rule or only when teachers make decisions on so-called marginal cases.

To be able to understand and make sense out of the grading process, it is important to find out what criteria are used by teachers and the degree to which they are used. It is also important to understand the underlying dimensions

of the criteria. By knowing the dimensions, a more accurate description of grading practices can be obtained.

The study has five purposes. First, it seeks to identify the criteria that teachers include in grading, specifically which of 35 grading criteria teachers say should and should not be included in grading. Second, it examines the weight teachers give to each of the grading criteria. The percentage teachers give to specific grading criteria is computed. The criteria to which most teachers give the most weight and the least weight are identified. Third, the study investigates the underlying dimensions of grading criteria under a general grading situation and under a specific grading situation in which grade level and subject area are specified. A comparison of dimensions under both general and specific situations is made. It is possible that grading criteria change somewhat when a teacher considers them in the context of a specific class. Fourth, the study examines the relationship between the degree of inclusion of specific grading criteria and the weight given to these criteria in a specific classroom context. It seeks to determine whether there is consistency between what teachers think should be included in grading and the weight they give to criteria in specific grading situation. Finally, the study compares elementary and high

school teachers in terms of specific grading criteria they use. It explores differences between these two groups of teachers on their ratings of grading criteria with respect to degree of inclusion in the grading process.

Methodology

The Instrument

The survey instrument used in the study consists of three sections. Section I, Background Information, seeks information about the gender of the teacher-respondent, grade level currently taught and the number of years of teaching experience. Section II is a list of 35 grading criteria. The instructions are for the teacher to rate the criteria according to the degree that each one should be included in grading, along a 4-point, Likert-type scale: "definitely include," "probably include," probably not include," and "definitely not include." Section III is the same list of grading criteria, with different instructions for teachers. In this section, teachers are asked to respond from a particular context, which they themselves supply by identifying one of their own classes by subject and grade level of the class. Teachers are then to indicate the approximate percentage they give to each grading criteria, again on a 4-point, Likert-type scale from "none

(0 %)," "small (1-10%)," "moderate (11-40%)," to "large (41-100%)." These four response categories were defined to correspond to a scale in which 10% or less is "small" and 41% or more is "large."

Sample

The sample consisted of 827 elementary and high school teachers from 18 school districts, representing various regions of the United States.

Of this group, 71% (n= 584) are female, and 28% (n=232) are male; 1% (n=11) did not indicate their gender. Forty-five per cent (n=371) of the respondents were elementary teachers; 55% (n=456) were high school teachers. The average number of years of teaching experience was 14 years, ranging from one year to 40 years.

Analyses

Descriptive statistics were used to address the questions: (1) What do teachers report to include in end-of-term grades? and (2) What is the relative weight that teachers give to grading criteria within their own classroom context? Factor analyses were used to examine the underlying dimensions of grading criteria under a general situation and under a specific classroom context. Pearson correlations were calculated to address the question, Is there a relationship between what teachers think should be

included in grading in general and the percentage that they give to grading criteria. Finally, a discriminant analysis between elementary and secondary teachers was utilized to address the question, Is there a difference between elementary and secondary school teachers in terms of 35 grading criteria?

Results

What criteria should be included in grading?

Frequencies of responses to the 35 criteria from Section II were tabulated. The medians, means and standard deviations were also computed and are presented in Table 1. Table 2 contains the combined frequencies of responses and corresponding percentages for the "definitely include" and "probably include" categories. The criteria are presented in descending order, from the highest frequency to the lowest.

Table 1 indicates that the most important criteria that teachers report they "should include" in grading are unit tests, announced quizzes, essays or term papers, effort and semester tests (median = 1.0). It should be noted that four of these five criteria are achievement-related and only one, effort, is not. Teachers also report the criteria that they would "probably include" classroom-related criteria

such as projects outside class, homework/assignments, book reports, participation in class, and exercises done in class (median = 2.0). Criteria they should "probably not include" are criteria such as spelling on papers or tests other than those on spelling, grammar on papers or tests other than those on English, handwriting neatness on papers or tests other than those on writing, consideration for other students, and aggressive/inappropriate behavior (median = 3.0). Finally, teachers report they should "definitely not include students' socioeconomic status, student's gender, or parents' involvement in either class activities, or school activities (median = 4.0).

Insert Table 1 about here.

Table 2 displays the frequencies of responses to the 35 criteria in Section II for the combined categories "definitely include" and "probably include." More than 75% of the teachers indicate that criteria such as unit tests, announced quizzes, effort of student, essays or term papers, projects outside class, and improvement during grading period should be included in grading. At least half of the teachers (50.2% to 74.5%) indicate that criteria such as lab reports, improvement from one grading period to the next,

ability level of student, participation in group discussion, and cheating should be included in grading. Fewer than half of the teachers (27.1% to 46.3%) indicate that spelling on papers or tests other than those in spelling, grammar on papers or tests other than those in English, consideration for other students, aggressive/inappropriate behavior, and handwriting neatness on papers or tests other than those in writing should be included in grading. Very few teachers (1.5 to 7.1%) indicate that shyness, student's socio-economic status, parents' involvement in class activities, or student's gender should be included in grading.

Insert Table 2 about here.

What is the relative weight that teachers give to grading criteria within their own classroom context?

The 35 criteria in Section III of the instrument can be divided into two categories, one category of criteria to which teachers give some weight, and a second category of criteria to which teachers do not give any weight at all. Table 3 presents the frequency and percentage of responses for the "None (0%)" and the combined "Small (1-10%)," "Moderate (11-40%)," and "Large (41-100%)" categories. More than 50% of the teachers indicate that they give some weight

to such criteria as unit tests, exercises done in class, announced quizzes, homework/assignments, and effort. Similarly, approximately 40% of the teachers indicated that they do not give any weight at all to such criteria as inattention in class, book reports, consideration for other students, and regular attendance.

What are the underlying dimensions of grading criteria under a general situation and under a specific classroom context?

To answer this two-part question, two exploratory factor analyses were performed. The first factor analysis used the 35 grading criteria from Section I. Initially, nine factors were extracted from the principal components analysis; these factors accounted for 66.6% of the variance in the responses. The second factor analysis used the 35 grading criteria from Section II. Eight factors were extracted in the principal components analysis; these 8 factors accounted for 65.7% of the total variance.

The 4-factor analysis was chosen on the basis of the strength of factor loadings for each factor as seen from Tables 4 and 5. Factor loadings range from a high value of 0.87 to a low value of 0.29 in the first factors analysis, and from 0.92 to 0.31 in the second factor analysis. The 4 factors account for 48.1% of the total variance.

The four factors and the criteria that go with each of them from the first factor analysis are presented in Table 6. These four factors are as follows: Factor 1 - classroom behavior and characteristics which are perceived by teachers to enhance or deter the learning process (improvement during the grading period, improvement from one grading period to another, effort of student, participation in class and in group discussions, and deterrent characteristics such as inattention in class); Factor 2 - assessment of achievement and academic content (unit tests, semester tests, announced quizzes, unannounced/pop quizzes, homework/assignments, etc.); Factor 3 - student behaviors and non-content academic skills (spelling on papers/tests other than those in spelling, grammar on papers or tests other than those in English, handwriting on papers/tests other than those in writing, etc.); and, Factor 4 - factors and student traits that teachers consider as external to the classroom (parents' involvement in school activities, parents' involvement in class activities, student's gender, and student's socio-economic status). These four factors appear consistently in both analyses; however, Factors 2 and 3 were switched in the second analysis. A few specific criteria became re-categorized under a different factor in the second analysis (e.g., Item 28, shyness, which in the first factor

analysis was associated with Factor 4 (loading = 0.56) became associated with Factor 1 (loading = 0.31) in the second factor analysis.

Insert Table 6 about here.

Is there a relationship between what teachers think should be included in grading in general and the percentage that they give to grading criteria?

Thirty-five correlations were calculated for the grading criteria in Section II and Section III. The ratings in Section II (the degree to which a grading criterion was included) were correlated with the ratings in Section III (the amount of percentage it is given in the grading process) for each of the 35 criteria. The rating scale for Section II was given a score from 1 to 4 with "definitely include" being given a score of "1" and "definitely not include," a score of "4." The rating scale for Section III was also given a score from 1 to 4, with "None (0%)" scored as "1" and "Large (41-100%)," as "4."

Table 7 presents the specific criteria and their respective correlation coefficients in order, from highest to lowest. The correlation coefficients are negative due to

the way the ratings were scored. All correlations are significant at a 0.002 alpha level.

Insert Table 7 about here.

The table indicates that the strongest correlations (-.55 to -.59) are those associated with such criteria as regular attendance, aggressive/inappropriate behavior, consideration for other students, cutting/skipping class, and cooperativeness. Moderate correlations (-0.35 to -0.54) are observed for such criteria as improvement during grading period, improvement from one grading period to the next, unannounced/pop quizzes, ability level, and standardized tests. Low correlations (-0.34 and lower) are noted for such criteria as book reports, unit tests, announced quizzes, and parents' involvement in either class or school activities.

Is there a difference between elementary and secondary school teachers in terms of the 35 grading criteria of Section II?

A direct discriminant analysis was initially performed using the 35 grading criteria of Section II as independent variables, and grade level taught (elementary and high school) as the group membership variable. The analysis

yielded one discriminant function with an eigenvalue of 0.21267, (χ^2 (35)= 98.823, $p \leq .05$). Table 8 presents the 35 criteria and the weights or correlations between the criteria and the discriminant function, taken from the structure matrix of the discriminant analysis. The variables that best discriminate between elementary and high school teachers are homework/assignments, cheating, lab reports, announced quizzes and checklist. The negative coefficients indicate that the direction of relationship between the variables (criteria) and teacher groups (elementary vs. secondary) is inverse, i.e., the variables (criteria) associated with the negative coefficients are more related to the elementary than to the secondary school teachers.

Insert Table 8 about here.

T-tests were also calculated for each of the 35 criteria in Section I to determine the specific criteria or variables in which the two groups of teachers (elementary and secondary) differ significantly (Table 9). Elementary and secondary school teachers differ significantly (reduced $\alpha = .001$) on 11 criteria or variables: standardized tests, announced quizzes, essays/term papers, lab reports, homework/assignments, group projects, grammar on papers or

tests other than those in English, improvement during the grading period, improvement from one grading period to another, cheating, and checklists. Elementary school teachers are significantly less likely to include standardized tests, announced quizzes, essays/term papers, lab reports, homework/assignments, group projects, and cheating in report card grading; however, they are more likely to include improvement during the grading period, improvement from one grading period to another, and checklists in their grading. Conversely, secondary school teachers are more likely to include standardized tests, announced quizzes, essays/term papers, lab reports, homework/assignments, group projects, and cheating in report card grading; however, they are less likely to include improvement during the grading period, improvement from one grading period to another, and checklists in their grading.

Insert Table 9 about here.

The results of the t-tests support the results of the discriminant analysis. Comparing Table 8 with Table 9, the criteria in which t-tests yield significant differences between elementary and high school teachers (Table 9) are

variables that have the highest coefficients in the structure matrix (Table 8). In addition, the three criteria that have the highest negative coefficients in Table 8, namely, checklist, improvement during the grading period, and improvement from one grading period to the next are the same three criteria or variables which elementary teachers are more likely to include in the grading process.

In summary, the study has identified five grading criteria that teachers indicate they "definitely include": unit tests, announced quizzes, essays or term papers, effort, and semester tests. Grading criteria that teachers say they will "probably include" are projects, assignments, book reports, participation in class, ability, and behavioral criteria such as cheating, cooperativeness, and attendance. Teachers also indicate that criteria such as spelling, grammar, handwriting, and aggressive or inappropriate behavior will "probably not" be included in grading. Gender, parents' involvement in school activities and parents' involvement in class activities are three criteria that teachers say they will "definitely not include."

Results also indicate that more than half of the teachers say they would give weight to such criteria as unit tests, exercises, announced quizzes, homework/assignments,

effort, projects, essays or term papers, participation in class, participation in group discussions, cheating, and cooperativeness. Similarly, more than 50% of the teachers said that they would not give any weight to such criteria as spelling, grammar, handwriting, aggressive or inappropriate behavior, shyness, student's socio-economic status, parents' involvement in school and class activities, and student's gender.

Four factors were identified as underlying dimensions of the 35 grading criteria and these four factors appear consistently in the two analyses using criteria in Section II and criteria in Section III as variables, respectively. These four factors are: classroom behavior and characteristics which are perceived by teachers as enhancing the learning process (such as improvement during and between grading period, effort, cooperativeness, participation in group discussions and in class, and ability level); assessment of achievement and academic content (such as unit tests, semester tests, announced and unannounced quizzes, homework/assignments, lab reports, book reports, essays or terms papers, and projects); student behaviors and noncontent academic skills (such as spelling, grammar, handwriting, completing work on time, attendance, cheating, behavior, and standardized tests); and, factors and student

traits that teachers consider as external to the classroom (such as parental involvement in class and school activities, gender, and socio-economic status).

The relationships between degree of inclusion ("definitely include," "probably include," probably not include," and "definitely not include") and weights given to each of the 35 grading criteria ("none," "small," "moderate," and "large") range from weak (low correlation of -0.24) to strong (correlation of -0.59). However, all the coefficients were found to be statistically significant at the reduced alpha level of 0.002. This means that specific grading criteria teachers say should be included in grading are the criteria to which they tend to give weight in their grading process. Conversely, specific grading criteria teachers say should not be included are criteria to which they tend to give little or no weight in their grading process.

Elementary and secondary school teachers were clearly different from each other on several specific grading criteria. The specific criteria that are identified more with elementary school teachers are checklists, improvement during the grading period, and improvement between grading periods. In contrast, the specific criteria that are more likely to be used by secondary school teachers are

standardized tests, announced quizzes, essays or term papers, lab reports, homework/assignments, projects, and cheating.

Discussion

From the results of the study, it seems appropriate to conclude that teachers do use both achievement and nonachievement criteria in grading. This agrees with the results of previous studies (Stiggins & Bridgeford, 1985; Nottingham, 1988; Traub, et al., 1988; Wright & Wiese, 1988). Grades reflect not only achievement but also other traits and behavior that are, in one way or another, related to achievement. Examples of achievement criteria that teachers use are tests, quizzes, essays or term papers and projects. Nonachievement criteria include effort, participation in class and group activities, improvement during grading period and from one grading period to another, and other behavioral traits such as cooperativeness, and cheating.

The study also indicates most teachers tend to use a variety of criteria and vary the weight they give to each criterion. Very few teachers claimed to give a large (41-100%) weight to any one criterion.

What grades indicate seems to be defined by the set of criteria that a teacher uses in a given classroom; thus, grades may have varied meanings or components, depending on the teacher and/or the classroom. The meaning of a grade in Algebra I may be different from the meaning of a grade in English II. Thus, grades become classroom-specific and must be interpreted as such.

The results of the factor analyses are helpful in describing the criteria that teachers use in grading. The four factors extracted through the analyses form four categories of criteria, namely, criteria that are achievement- or classroom content-related (such as tests, quizzes, projects, papers); criteria that are either characteristics or behaviors that facilitate or interfere with learning (such as effort, cooperativeness, participation, ability level, inattention); characteristics that are academic in nature but not necessarily related to the specific classroom content (such as spelling, grammar, handwriting, attendance, cutting/skipping class, completing work on time); and characteristics that are related to overall school or classroom performance but are external to the classroom (such as parental involvement in class and school activities, gender and socio-economic status of the student).

Tests, quizzes, and the other criteria that fall under the first factor seem to be direct measures of achievement; the other traits and behaviors that fall under the other three factors are somewhat related to classroom achievement although not directly. These four factors can be used as conceptual or theoretical basis for describing the components of a grade, or what general dimensions are included in the grading process.

Teachers are fairly consistent in their statements about the specific grading criteria that they include in grading and the weight that they give the criteria. Greater weight is given to criteria that teachers say they will definitely and/or probably include. Lesser or no weight is given to criteria that teachers say they will probably and/or definitely not include in grading.

Elementary and secondary school teachers differ in terms of the criteria that they include in grading. Elementary school teachers use a more global assessment of achievement such as improvement during the grading period and improvement from one grading period to the next, whereas secondary school teachers have a variety of assessments (tests, quizzes, projects, homework, and other student products). This indicates that this difference must be taken into consideration each time that the issue of grading

is discussed or studied. Grading in elementary schools differs from grading in secondary schools; policies and changes in the former may not necessarily be applicable to the latter.

The assigning of grades has been described as one of the most distasteful aspects of teaching, a necessary evil (Terwilliger, 1971). The abolishment of the grading system has been expressed, and several alternative methods have also been proposed. The grading process has become a complex, varied, subjective procedure, thereby eliciting questions on its continued practice. Part of the reason why the objectivity and credibility of the grading process has been challenged is that little is known about the specific criteria that teachers, in general, include in grading, or how the specific criteria are evaluated and used in combination when teachers make decisions on a student's end-of-term grade.

It has been the practice to include criteria such as effort, attitude, and behavior in grading. This may be justified by considering that a student's classroom performance or achievement is certainly affected by such variables, even if they are considered nonachievement in nature. However, from a serious consideration of this

practice including such nonachievment criteria in grading in addition to achievement criteria is like "double jeopardy."

It is possible that what teachers say they will do given certain situations is not what they do in actual situations. Additional study to find out what teachers actually do in real-life grading situations is needed. In addition, there is no information on how teachers measure the nonachievement criteria. Knowledge about this is an important aspect of the grading process.

The components of a grade should be clearly defined and decided by teachers, and clearly communicated to students. If teachers decide to include nonachievement criteria like effort and improvement, these criteria must be incorporated in the grading process in a consistent manner. In addition, students need to be informed how they will be evaluated and what criteria are being included in their grade, and in what way. Teachers not only need to evaluate the work and progress of students with objectivity but also with care. Grades are factors that affect students' self-images as learners and as individuals, and, in effect, do influence their attitudes toward school work and their future.

References

Agnew, E. (1985). The grading policies and practices of high school teachers. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Drucker, H, & Hansen, B. (1982). Grading the mainstreamed handicapped: Issues and suggestions for the regular social studies classroom teacher. Social Studies, 73, 250-252.

Hills, J. R. (1981). Measurement and evaluation in the classroom. Columbus, OH: Merrill.

Hoctor, M. & Kaplan, S. (1989). Developing policies for a gifted/talented program: A handbook. Canoga Park, CA: California Association for the Gifted.

Kirschenbaum, H., Napier, R., & Simon, S. B. (1971). Wad-ja-get? The grading game in American education. New York: Hart.

Leiter, J., & Brown, J. S. (1985). Determinants of elementary school grading. Sociology of Education, 58, 166-180.

Lister, R. (1983). Grading practices for educationally handicapped students in secondary schools: Issues, problems, and needs (Resource Paper No. 23). Concord, NH: State Department of Education.

Nottingham, M. (1988). Grading practices--watching out for land mines. NASSP-Bulletin, 72, 24-28.

Stiggins, R. J., & Bridgeford, N. J. (1985). The ecology of classroom assessment. Journal of Educational Measurement, 22, 271-286.

Stiggins, R. J., Friesbie, D. A., & Griswold, P. A. (1986). Inside high school grading practices: The Northwest Regional Educational Laboratory Program Report. Portland, OR: Northwest Regional Educational Lab.

Terwilliger, J. S. (1971). Assigning grades to students. Glenview, Ill: Foresman Scott.

Traub, R., Nagy, P., MacRury, K., & Klaiman, R. (1988). Teacher assessment practices in a senior high school mathematics course (Final Report). Toronto: Ontario Inst. for Studies in Education.

Table 1

Medians, means and standard deviations of responses to what criteria should be included in grading

CRITERIA	MEDIAN	MEAN	S.D.
Unit tests	1	1.28	0.59
Announced quizzes	1	1.45	0.71
Essays or term papers	1	1.59	0.82
Effort	1	1.61	0.73
Semester tests	1	1.75	0.98
Projects outside class	2	1.71	0.77
Homework/assignments	2	1.75	0.85
Completing work on time	2	1.77	0.78
Improvement dur gr prd	2	1.77	0.78
Book reports	2	1.77	0.88
Participation in class	2	1.85	0.83
Exercises done in class	2	1.86	0.86
Group projects	2	1.88	0.77
Lab reports	2	1.88	0.94
Improvement from one grading period to next	2	1.94	0.87
Cheating	2	1.96	1.02
Ability level	2	1.98	0.93
Participation in grp disc	2	1.99	0.84
Cutting/skipping class	2	2.30	1.06
Regular Attendance	2	2.37	1.05
Unannounced/pop quizzes	2	2.39	0.95
Cooperativeness	2	2.42	0.98
Inattention in class	2	2.46	0.99
Spelling on papers or tests (other than spelling)	3	2.50	0.95
Grammar on papers or tests (other than English)	3	2.59	0.90
Consideration for other st	3	2.65	1.02
Aggressive/inapprop beh	3	2.71	1.05
Handwrtng neatness on papers/ tests (other than writing)	3	2.72	0.89
Checklist	3	2.93	0.98
Standardized tests	4	3.20	1.02
Shyness	4	3.51	0.71
Student's socioecon stat	4	3.78	0.55
Student's gender	4	3.86	0.44
Parents' involvement in class activities	4	3.86	0.44
Parents' involvement in school activities	4	3.87	0.40

Note: 1 = definitely include 2 = probably include
3 = probably not include 4 = definitely not include

Table 2

Combined frequencies for "definitely include" and "probably include" responses for grading

CRITERIA	FREQUENCY	PERCENTAGE
Unit tests	783	94.7
Announced quizzes	752	91.0
Effort of student	730	88.3
Essays or term papers	715	86.4
Projects outside class	696	84.2
Improvement during grading period	687	83.1
Completing work on time	683	82.6
Homework/assignments	676	81.8
Group projects	665	80.4
Book reports	659	79.7
Semester tests	653	79.0
Participation in class	646	78.1
Exercises done in class	628	76.0
Lab reports	616	74.5
Improvement from one grading period to the next	612	74.0
Ability level of student	604	73.1
Participation in group discussion	604	73.0
Cheating	587	70.9
Cutting/skipping class	462	55.9
Unannounced/pop quizzes	461	55.8
Cooperativeness	451	54.5
Regular attendance	441	53.4
Inattention in class	415	50.2
Spelling on papers or tests (other than spelling)	383	46.3
Grammar on papers or tests (other than English)	352	42.5
Consideration for other students	350	42.3
Aggressive/inappropriate behavior	301	36.4
Handwriting neatness on papers or tests (other than writing)	289	34.9
Checklist	224	27.1
Standardized tests	198	23.9
Shyness	58	7.1
Student's socio-economic status	36	4.4
Parents' involvement in class activities	16	1.9
Student's gender	14	1.7
Parents' involvement in school activities	12	1.5

Table 3

Percentages and frequencies given by teachers to 35 grading criteria (n=827)

CRITERIA	NONE (0%) N (%)	SMALL-TO-LARGE (1-100%) N (%)
Unit tests	70(8.5)	712(86.1)
Exercises done in class	104(12.6)	671(81.1)
Announced quizzes	115(13.9)	662(80.0)
Homework/assignments	126(15.2)	652(78.8)
Effort	125(15.1)	644(77.9)
Completing work on time	145(17.5)	625(75.6)
Group projects	159(19.2)	598(72.3)
Participation in class	180(21.8)	592(71.6)
Improvement during grading period	193(23.3)	575(69.5)
Projects outside class	195(23.6)	567(68.6)
Participation in group discussions	214(25.9)	548(66.3)
Improvement from one grading period to the next	248(30.0)	513(62.0)
Ability level	265(32.0)	500(60.5)
Semester tests	271(32.8)	497(60.1)
Cheating	276(33.4)	461(55.7)
Unannounced/pop quizzes	330(39.9)	437(52.8)
Cooperativeness	331(40.0)	435(52.6)
Essays or term papers	314(38.0)	429(51.9)
Inattention in class	385(46.6)	373(45.1)
Book reports	381(46.1)	361(43.7)
Consideration for other students	406(49.1)	354(42.8)
Regular Attendance	413(49.9)	347(42.0)
Spelling on papers or tests (other than spelling)	422(51.0)	336(40.6)
Cutting/skipping class	411(49.7)	335(40.5)
Grammar on papers or tests (other than English)	432(52.2)	314(38.0)
Handwriting neatness on papers or tests (other than writing)	446(53.9)	311(37.6)
Aggressive/inappropriate behavior	459(55.5)	302(36.5)
Lab reports	427(51.6)	285(34.5)
Checklist	483(58.4)	191(23.1)
Standardized tests	594(71.8)	172(20.8)

Table 3 (continued)

CRITERIA	NONE (0%) N (%)	SMALL-TO-LARGE (1-100%) N (%)
Shyness	685(82.8)	75(9.1)
Student's socioeconomic status	731(88.4)	36(4.4)
Parents' involvement in school activities	746(90.2)	27(3.3)
Parents' involvement in class activities	747(90.3)	23(2.8)
Student's gender	752(90.9)	18(2.2)

Table 4
Factor analysis I: Factor and factor loadings of items in criteria which should be included in grading (rotated factor matrix)

	F 1	F 2	F 3	F 4
I21 improve during	.83	.03	-.10	.0002
I22 improve between	.79	.01	-.04	.01
I20 effort	.76	.03	.08	-.004
I30 cooperativeness	.65	-.15	.44	.06
I31 consideration	.61	-.19	.42	.11
I13 participate group	.61	.15	.16	.08
I14 participate class	.60	.12	.27	.02
I27 inattention	.58	-.09	.52	.06
I19 ability level	.55	-.02	.21	.07
I29 checklist	.44	-.14	.16	.22
I12 exercises in class	.29	.16	.14	.11
I9 lab reports	.08	.80	-.01	-.02
I7 essays/papers	-.04	.78	-.04	-.09
I8 book reports	.15	.76	.03	.03
I4 announced quiz	-.03	.64	.12	-.08
I2 unit tests	-.14	.60	.02	-.06
I6 projects outside	.06	.60	.22	-.08
I1 semester tests	-.08	.54	.07	.03
I11 group projects	.34	.51	.05	.01
I5 unannounced quiz	-.12	.47	.31	.05
I10 homework/assign	.07	.43	.32	-.03
I15 spelling	.06	.15	.65	.13
I24 cheating	.19	.17	.65	-.05
I25 cutting class	.37	.09	.65	.01
I16 grammar	.08	.17	.62	.12
I17 handwriting	.14	.05	.58	.17
I23 aggressive	.49	-.16	.56	.11
I26 regular attendance	.51	.01	.56	.09
I18 complete work	.24	.16	.55	-.02
I3 stand tests	-.04	.14	.29	.21
I34 parents-school	.03	-.02	.05	.87
I33 gender	.02	-.06	.05	.83
I35 parents-class	.05	-.02	.07	.76
I32 socioecon st	.07	-.03	.07	.70
I28 shyness	.20	-.10	.21	.56

Table 5

Factor analysis II: Factor and factor loadings of criteria included in grading (rotated factor matrix)

	F 1	F 2	F 3	F 4
II20 effort	.77			
II21 improve during	.77			
II22 improve between	.76			
II13 participate group	.71			
II14 participate class	.69			
II19 ability level	.66			
II29 checklist	.55			
II12 exercises in class	.54			
II28 shyness	.31			
II26 regular attend	.32	.77		
II25 cutting class		.75		
II27 inattention	.37	.74		
II23 aggressive beh	.33	.72		
II24 cheating		.68		
II31 consideration	.51	.65		
II30 cooperativeness	.56	.63		
II18 complete work		.55		
II17 handwriting		.48		
II7 essays/papers			.78	
II6 projects outside			.74	
II8 book reports			.73	
II9 lab reports			.66	
II5 unannounced quiz			.56	
II11 group projects	.46		.56	
II4 announced quiz			.5[illegible]	
II16 grammar		.39	.47	
II15 spelling		.43	.46	
II2 unit tests			.45	
II10 homework/assign			.45	
II1 semester tests			.44	
II3 stand tests			.32	
II35 parents-class				.92
II34 parents-school				.89
II33 gender				.84
II32 socioecon st				.75

Only loadings greater than .3 are included.

Table 6

Factors and specific criteria for factor analysis I

FACTOR		SPECIFIC CRITERIA
Factor 1	I21	Improvement during grading period
	I22	Improvement from one grading period to next
	I20	Effort of student
	I30	Cooperativeness
	I31	Consideration
	I13	Participation in group discussions
	I14	Participation in class
	I27	Inattention in class
	I19	Ability level of student
	I29	Checklist
	I12	Exercises done in class
Factor 2	I9	Lab reports
	I7	Essays or term papers
	I8	Book reports
	I4	Announced quizzes
	I2	Unit tests
	I6	Projects outside class
	I1	Semester tests
	I11	Group projects
	I5	Unannounced/pop quizzes
	I10	Homework/assignments
Factor 3	I15	Spelling on papers/tests (other than spelling)
	I24	Cheating
	I25	Cutting/skipping class
	I16	Grammar on papers or tests (other than English)
	I17	Handwriting on papers/tests (other than writing)
	I23	Aggressive/inappropriate behavior
	I26	Regular attendance
	I18	Completing work on time
	I3	Standardized tests
Factor 4	I34	Parents' involvement in school activities
	I33	Student's gender
	I35	Parents' involvement in class activities
	I32	Student's socio-economic status
	I28	Shyness

Table 7

Correlation coefficients of ratings of the 35 grading criteria

CRITERIA	CORR COEF (r)
Checklist	-0.59
Regular Attendance	-0.59
Aggressive/inappropriate behavior	-0.59
Consideration for other students	-0.58
Cutting/skipping class	-0.56
Cooperativeness	-0.56
Inattention in class	-0.55
Cheating	-0.55
Improvement during grading period	-0.54
Improvement from one grading period to next	-0.53
Unannounced/pop quizzes	-0.52
Ability level	-0.52
Standardized tests	-0.51
Spelling on papers or tests (other than spelling)	-0.50
Participation in group discussions	-0.50
Effort	-0.50
Semester tests	-0.50
Participation in class	-0.49
Grammar on papers or tests (other than English)	-0.48
Homework/assignments	-0.46
Handwriting neatness on papers or tests (other than writing)	-0.46
Completing work on time	-0.46
Exercises done in class	-0.44
Projects outside class	-0.43
Shyness	-0.38
Group projects	-0.38
Student's socioeconomic status	-0.36
Essays or term papers	-0.35
Book reports	-0.34
Unit tests	-0.32
Announced quizzes	-0.31
Parents' involvement in class activities	-0.31
Lab reports	-0.29
Parents' involvement in school activities	-0.28
Student's gender	-0.24

Table 8

Structure matrix: Pooled within-groups correlations between discriminating variables and canonical discriminant functions

ITEM	CORR COEF
I10 - homework/assignments	0.47
I24 - cheating	0.41
I9 - lab reports	0.36
I4 - announced quizzes	0.32
I29 - checklist	-0.31
I3 - standardized tests	0.29
I21 - improvement during grading period	-0.28
I11 - group projects	0.28
I18 - completing work on time	0.24
I1 - semester tests	0.22
I6 - projects outside class	0.22
I16 - grammar on papers or tests (other than English)	0.21
I22 - improvement from one grading period to the next	-0.21
I7 - essays or term papers	0.19
I2 - unit tests	0.19
I12 - exercises done in class	0.18
I15 - spelling on papers or tests (other than spelling)	0.17
I13 - participation in group discussions	-0.16
I30 - cooperativeness	-0.14
I20 - effort of student	-0.14
I25 - cutting/skipping class	0.13
I32 - student's socio-economic status	0.11
I5 - unannounced/pop quizzes	0.11
I27 - inattention in class	-0.10
I31 - consideration for other students	-0.10
I26 - regular attendance	0.10
I8 - book reports	0.09
I35 - parents' involvement in class activities	-0.08
I28 - shyness	-0.08
I17 - handwriting neatness on papers or tests (other than writing)	-0.08
I23 - aggressive/inappropriate behavior	-0.07
I34 - parents' involvement in school activities	-0.06
I19 - ability level of student	-0.05
I33 - student's gender	-0.04
I14 - participation in class	0.02

Table 9

T-test statistics for 35 grading criteria using pooled variance estimates to test differences between secondary and elementary classroom teachers.

	VARIABLES	t	DF	2-TAIL p
I1	sem tests	3.02	797	.003
I2	unit tests	2.54	816	.011
I3	stand tests	3.72	793	.001**
I4	announced quiz	5.66	808	.001**
I5	unannounced quiz	2.14	807	.032
I6	projects	2.75	796	.006
I7	essays, term paper	3.29	801	.001**
I8	book reports	1.29	797	.197
I9	lab reports	5.26	773	.001**
I10	homework, assignments	6.85	811	.001**
I11	group projects	3.46	808	.001**
I12	exercises	2.25	815	.024
I13	participate-grp	-2.47	809	.014
I14	participate-cls	0.11	809	.915
I15	spelling	2.31	803	.021
I16	grammar	3.32	799	.001**
I17	handwriting	-1.55	792	.122
I18	complete work	2.97	806	.003
I19	ability	-1.14	799	.255
I20	effort	-1.35	812	.178
I21	improve-during	-4.05	808	.001**
I22	improve-one-nxt	-3.24	798	.001**
I23	aggressive beh	-1.18	806	.239
I24	cheating	5.64	804	.001**
I25	cutting class	2.09	797	.037
I26	reg attendance	1.30	800	.195
I27	inattention	-1.52	803	.129
I28	shyness	-1.96	800	.050
I29	checklist	-4.71	674	.001**
I30	cooperativeness	-1.89	810	.059
I31	consideration	-1.65	809	.098
I32	socio-econ st	0.66	813	.510
I33	gender	-0.93	811	.354
I34	parents-sch act	-1.38	818	.168
I35	parents-cls act	-1.37	817	.173

** significant at $p \leq 0.001$